# Repair and Restore Your Mosley Beam

## Refurbish one of these popular Yagi antennas.

**Dick Sander, K5QY**

Mosley beam traps and tuning are stable and consistent, making them very repairable. I've owned several Mosley Classic 33 and PRO 57B Yagis, and I've even converted an obsolete PRO 77 into a Classic 36. Once you understand their construction, you can easily test and repair them.

Mosley has been great with support and installation instructions. All Mosley parts can be purchased, but most traps can be repaired for minimal cost, making them an inexpensive beam antenna for ARRL Field Day or for your home. Mosley uses two resonant LC traps inside a 2-inch diameter by 12-inch-long tube. The capacitance between the coils and the tubing forms the C in the resonant LC trap. Figure 1 shows a cutaway view of the 12-inch tube containing a 10 meter and a 15 meter trap.

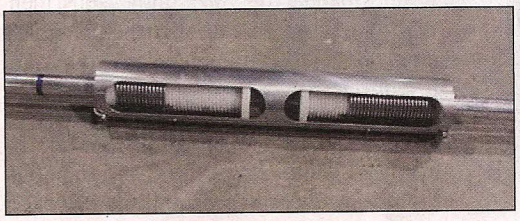

**Figure 1** — Cutaway view shows a two-coil trap. The coils and tube capacitance form a resonant circuit, and the 2-inch outer tube is part of an element (usually for 15 meters).

### Checking, Measuring, and Repairing Traps

Traps for each frequency consist of a different number of turns, as listed in the assembly manual. You can check traps without disassembling them. First, use an ohmmeter to check continuity (near zero resistance) between the 2-inch tube and its adjacent element. Then use an LC meter (I use the L/C Meter IIB, connected as shown in Figure 2) to accurately measure the trap inductance. Label each trap with its number of turns and inductance. Table 1 lists the various inductances versus number of turns for the traps.

Remove the black weather caps, then remove the flathead screws that retain the coil. On stuck traps, I apply WD-40® to each end, and spray some into the drain holes, then wiggle the trap vigorously to remove it. Check each side to see which one removes more easily. After removing one of the traps, use a 1¼-inch O.D. piece of PVC tubing to drive out the stuck spool (see Figure 3). Use contact cleaner to remove the oil and dirt.

**Table 1**
**Inductances of the Traps**

| Number of turns | Left trap, µH | Right trap, µH |
|---|---|---|
| 14 | 1.51 | 1.53 |
| 15 | 1.62 | 1.66 |
| 16½ | 1.76 | 1.74 |
| 23 | 2.51 | 2.50 |
| 25 | 2.78 | 2.76 |
| 26 | 2.90 | 2.94 |

After a broken trap (see Figure 4) is removed and cleaned, place the end with the screws (or pop rivets) into a bench vice. I used instant-bond glue to repair broken spools, then used PVC tubing to hammer the spool together. Visually inspect the repaired trap for shorts between windings.

You can rewind a bad coil on an otherwise good spool (see Figure 5). You can also change from one Mosley model to another


**Figure 2** — Connect an LC meter as shown to measure the trap inductance.

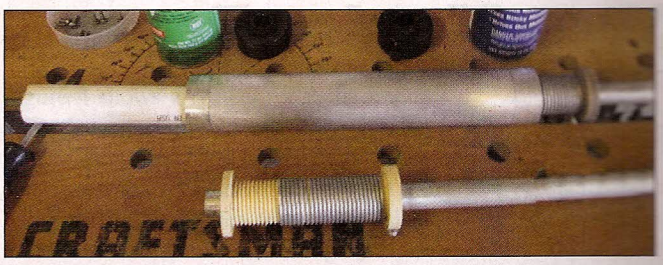

**Figure 3** — Drive out a stuck trap by using PVC tubing (left) as a driver. Two black end caps can be seen above the trap.

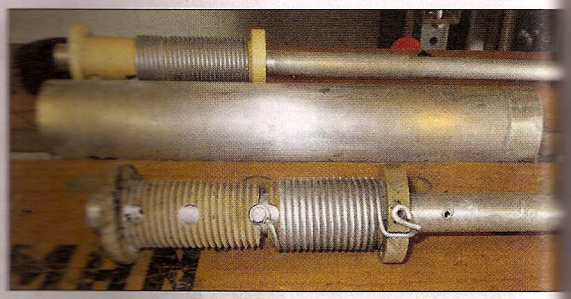

Figure 4 — A broken spool (foreground).

**Figure 5** — A coil spool with new windings.

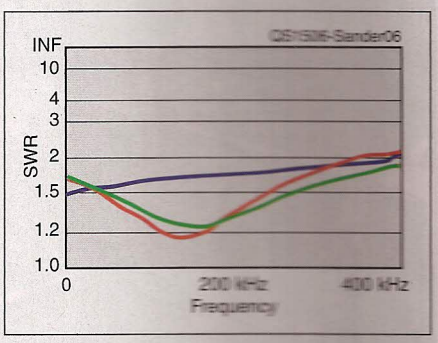


**Figure 6** — VSWR measurement of the Yagi. Frequency is relative to the lower band edge of the 20 meter (red), 15 meter (green), and 10 meter (blue) bands.

by rewinding traps to match the new model. When I converted an older PRO 77 to a Classic 36, I did it by rewinding two traps.

I had difficulty keeping the turns from touching when using #12 AWG solid copper wire, so I substituted #14 AWG wire, with good results. Older traps used a slot head screw to secure the coil, newer spools use a pop rivet. Drill out the pop rivet and replace it with a #6 metal screw. Wrap two turns of Teflon® tape to protect the coil from shorting between the turns and the screw.

I use all-new stainless steel hardware where old hardware is missing or damaged. Completely disassemble all of the tubing and use a fine sanding block to polish every element and component. Consult the assembly manual for proper dimensions, then reinstall the boom and elements. Double-check the traps and ensure that they are installed on the correct elements.

## Results

The lead photo shows the Classic 36 that I converted from a discarded PRO 77 antenna. I hung it from a ladder to find the best balancing point. The Classic series incorporates a capacitive feed system that uses 87-inch-long #14 AWG wire in each leg of the driven element. I use the center conductor from RG-213 coax. The manual shows you how to tune your refurbished antenna. After reassembly, I te performance with a nearby ham a to-back was typically 2 S-units. shows the VSWR for each band.

It's a lot of work to repair or conver It's my hope that details in this ar you the confidence to take on a r toration project.

All photos by the author.

ARRL life member Dick Sander, K5QY licensed in 1958. He holds an AAS de Industrial Electronics and a BA degree ness. Dick retired from Rockwell/Alcat after 25 years as a senior technical wri listed on the DXCC #1 Honor Roll and 7B-DXCC and WAS while mobile. Dick ARRL DXCC card checker. He models and builds antennas from 160 meter ph verticals to 440 MHz Yagis. You can rea at 110 Starlite Drive, Murphy, TX 7509 **k5qy1@verizon.net** or visit his websi **www.k9qy.net**.

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